



Practitioner's Docket No. F-7392 D3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

DIVISIONAL APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of
Inventors.

ARTHUR VANMOOR

For (title):

CAULKING GUN AND CARTRIDGE WITH AFTERFLOW PREVENTION

1. Type of Application

This new application is for a

- ☒ Divisional.
☐ Continuation.
☐ Continuation-in-part (C-I-P).

2. Benefit of Prior U.S. Application(s) (35 U.S.C. 119(e), 120, or 121)

- ☒ The new application being transmitted claims the benefit of prior U.S. application.
Enclosed are ADDED PAGES FOR NEW APPLICATION TRANSMITTAL
WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

3. Papers Enclosed

A. Required for Filing Date under 37 C.F.R. 1.53(b)

14 Pages of Specification
2 Pages of Claims
4 Sheets of Drawing
☒ Formal
☐ Informal

B. Other Papers Enclosed

1 Page of Abstract
 Other

4. Additional Papers Enclosed

- ☐ Preliminary Amendment
- ☒ Information Disclosure Statement (37 C.F.R. 1.98)
- ☒ Form PTO-1449 (PTO/SB/08A and 08B)
- ☐ Citations
- ☐ Declaration of Biological Deposit
- ☐ Submission of "Sequence Listing," computer readable copy and/or amendment pertaining thereto for biotechnology invention containing nucleotide and/or amino acid sequence.
- ☐ Authorization of Attorney(s) to Accept and Follow Instructions from Representative
- ☐ Special Comments
- ☐ Other

5. Declaration or Oath

- ☒ Enclosed
- Executed by
 - ☒ inventors.
 - ☐ legal representative of inventor(s). 37 CFR 1.42 or 1.43.
 - ☐ joint inventor or person showing a proprietary interest on behalf of inventor who refused to sign or cannot be reached.
 - ☐ This is the petition required by 37 CFR 1.47 and the statement required by 37 CFR 1.47 is also attached. See item 13 below for fee.
- ☐ Not Enclosed.

6. Inventorship Statement

The inventorship for all the claims in this application are:

- ☒ The same.
- or**
- ☐ Not the same. An explanation, including the ownership of the various claims at the time the last claimed invention was made,
 - ☐ is submitted.
 - ☐ will be submitted.

7. Language

- ☒ English
- ☐ Non-English
 - ☐ The attached translation includes a statement that the translation is accurate. 37 C.F.R. 1.52(d).

8. Assignment

- ☐ An assignment of the invention to
 - ☐ is attached. A separate ☐ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.
 - ☐ will follow.

☐ was filed in parent application No.

9. Certified Copy

Certified copies of applications

<u>NETHERLANDS</u>	<u>9401492</u>	<u>SEPTEMBER 13, 1994</u>
Country	Applic. No.	Filed

from which priority is claimed

☐ is (are) attached.

☐ will follow.

☒ was filed in parent application No. 08/527,755.

10. Small Entity Statement(s)

☐ Statement(s) that this is a filing by a small entity under 37 CFR 1.9 and 1.27 is (are) attached.

☒ Status as a small entity was claimed in prior application 08/527,755, filed on September 13, 1995, from which benefit is being claimed for this application under:

35 U.S.C. § ☐ 119(c),
☐ 120,
☒ 121,
☐ 365(c),

and which status as a small entity is still proper and desired.

☒ A copy of the statement in the prior application is included.

Filing Fee Calculation (50% of A, B or C above) \$ _____

11. Fee Payment Being Made at This Time

☐ Not Enclosed

☐ No filing fee is to be paid at this time.

(This and the surcharge required by 37 C.F.R. 1.16(e) can be paid subsequently.)

☒ Enclosed

☒ Filing fee \$ 380.00

Total Fees Enclosed \$ 380.00

12. Method of Payment of Fees

☒ Check in the amount of \$ 380.00 .

☐ Charge Account No. _____ in the amount of \$ _____.
A duplicate of this transmittal is attached.

15. Authorization to Charge Additional Fees

☒ The Commissioner is hereby authorized to charge the following additional fees by this paper and during the entire pendency of this application to Account No. 12-1099.

☒ 37 C.F.R. 1.16(a), (f) or (g) (filing fees)

☒ 37 C.F.R. 1.16(b), (c) and (d) (presentation of extra claims)

☒ 37 C.F.R. 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date later than the filing date of the application)

☒ 37 CFR 1.17(a)(1)-(5) (extension fees pursuant to § 1.136(a).

☒ 37 C.F.R. 1.17 (application processing fees)

☐ 37 C.F.R. 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. 1.311(b))

16. Instructions as to Overpayment

☒ Credit Account No. 12-1099.

☐ Refund


SIGNATURE OF PRACTITIONER

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/bb

"Express Mail" mailing label number EL080657663US
Date of Deposit: May 28, 1999

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.


Xiomara D. JUNCO

☒ **Incorporation by reference of added pages**

(check the following item if the application in this transmittal claims the benefit of prior U.S. application(s) (including an international application entering the U.S. stage as a continuation, divisional or C-I-P application) and complete and attach the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED)

- ☒ Plus Added Pages for New Application Transmittal Where Benefit of Prior U.S. Application(s) Claimed

Number of pages added 1

- ☒ Plus Added Pages for Papers Referred to in Item 4 Above

Number of pages added 6

- ☐ Plus added pages deleting names of inventor(s) named on prior application(s) who is/are no longer inventor(s) of the subject matter claimed in this application.

Number of pages added _____

- ☐ Plus "Assignment Cover Letter Accompanying New Application"

Number of pages added _____

☐ **Statement Where No Further Pages Added**

(if no further pages form a part of this Transmittal, then end this Transmittal with this page and check the following item)

- ☐ This transmittal ends with this page.

ADDED PAGE FOR SPECIAL COMMENTS FOR NEW APPLICATION TRANSMITTAL

This divisional application claims the benefit under 35 U.S.C. § 120 of U.S. application No. 08/527,755, filed September 13, 1995.

Applicant : ARTHUR VAN MOERKERKEN
Filed : Concurrently herewith
Title : CAULKING GUN AND CARTRIDGE WITH AFTERFLOW
PREVENTION

Verified Statement (Declaration) Claiming Small Entity
Status (37 CFR 1.9(f) and 1.27(b)) - Independent Inventor

As a below named inventor, I hereby declare that I qualify as
an independent inventor as defined in 37 CFR 1.9(c) for
purposes of paying reduced fees under section 41(a) and (b) of
Title 35, United States Code, to the Patent and Trademark
Office with regard to the invention entitled CAULKING GUN AND
CARTRIDGE WITH AFTERFLOW PREVENTION

(X) the specification filed herewith


I have not assigned, granted, conveyed or licensed and am under
no obligation under contract or law to assign, grant, convey or
license, any rights in the invention to any person who could
not be classified as an independent inventor under 37 CFR
1.9(c) if that person had made the invention, or to any concern
which would not qualify as a small business concern under 37
CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned,
granted, conveyed, or licensed, or am under an obligation under
contract or law to assign, grant, convey, or license any rights
in the invention is listed below:

(X) no such person, concern, or organization:
() persons, concerns or organizations listed below

I acknowledge the duty to file, in this application or patent,
notification of any change in status resulting in loss of
entitlement to small entity status prior to paying, or at the
time of paying, the earliest of the issue fee or any
maintenance fee due after the date on which status as a small
entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own
knowledge are true and that all statements made on information
and belief are believed to be true; and further that these
statements were made with the knowledge that willful false
statements and the like so made are punishable by fine or
imprisonment, or both, under section 1001 of Title 18 of the
United States Code, and that such willful false statements may
jeopardize the validity of the application, any patent issuing
thereon, or any patent to which this verified statement is
directed.


ARTHUR VAN MOERKERKEN

Sept. 12, 1995
Date

CAULKING GUN AND CARTRIDGE WITH AFTERFLOW PREVENTION

5 Cross-Reference to Related Application:

This is a division of copending application No. 08/990,349,
filed December 15, 1997; which was a division of application
No. 08/710,342, filed September 16, 1996, now U.S. Patent No.
5,704,518; which was a division of application No.

10 08/527,755, filed September 1995, now U.S. Patent No.
5,582,331.

Background of the Invention:

Field of the Invention:

15 The invention relates to caulking guns and to dispensing
cartridges, and more particularly to the type of composition
dispensers in which a cartridge is placed into a gun
structure and a piston urges a plunger forwardly from the
rear of the cartridge, thus reducing a volume available for
20 the composition inside the cartridge and forcing the
composition from an open tip at the front of the cartridge.

These types of caulking guns have been the subject of
undesirable afterflow, i.e. the interior of the cartridge is
25 still subject to overpressure after the plunger is no longer

actively urged forward and, as a result, additional amounts of composition are forced from the cartridge.

Two primary reasons for the afterflow phenomenon are

5 recognized. Firstly, the usually thin-walled cartridge expands during the plunger actuation and, according to the physical law that systems always attempt to return to the relaxed state, the cartridge wall relaxes after the plunger actuation. Due to the fact that prior art backwalls of the
10 cartridges have been devised to retain their forward-most position and that the plunger of the caulking gun is typically locked against a return movement, the relaxation of the cartridge wall leads to afterflow, i.e. to oozing at the dispensing tip. Secondly, most caulking compositions have a
15 high degree of viscosity and are at least marginally compressible, which, upon plunger actuation, causes a substantial internal pressure buildup which, after the plunger is no longer forced forward, also leads to oozing at the dispensing tip.

20
Description of the Related Art:

The afore-described afterflow problem is often answered in the context of conventional prior art structures by quickly releasing and moving back the gun plunger as soon a
25 sufficient amount of composition has been dispensed.

U.S. Patent No. 5,236,105 to Galex describes a novel system for preventing over-ejection. In that system, conventional caulking guns are retrofitted with several members, namely a female element, male element, a return spring, and a stop.

5 The spring is utilized as an active bias sing element which actively pulls back the backwall in the cartridge and thus introduces a relative vacuum inside the cartridge.

U.S. Patent No. 4,834,268 to Keller describes a plunger
10 system in which an elastic sealing ring is urged towards the inner wall surface of the cartridge by a radial component of the force which urged to plunger forwardly in the dispensing mode. When the plunger is no longer actuated, the sealing ring relaxes slightly and allows the plunger to relax the
15 inside cartridge pressure.

The first of the above-noted methods of preventing afterflow is clearly unsatisfactory. The systems described in the two afore-mentioned patents are quite complicated and thus rather
20 expensive.

Summary of the Invention:

It is accordingly an object of the invention to provide a caulking gun and cartridge with afterflow prevention, which
25 overcomes the above-mentioned disadvantages of the prior art devices and methods of this general type. The primary object

is to provide a simple and inexpensive system which is applicable to a wide array of cartridges and caulking guns and which safely prevents overflow or over-ejection.

5 With the foregoing and other objects in view there is provided, in accordance with the invention, an improved caulking cartridge, of the type having a substantially tubular body, a forward dispensing opening at a forward end of the tubular body, a backwall movably disposed within the
10 tubular body, the tubular body having a wall with an inner wall surface defining an inner diameter of the tubular body, and the tubular body defining a chamber therein bounded by the inner wall surface, the forward end and the backwall. The improvement is defined in that the backwall has a
15 diameter which is less than the inner diameter of the tubular body and there is defined a substantially contact-free spacing distance between the inner wall surface and a periphery of the backwall.

20 In accordance with an added feature of the invention, the distance is at least 0.2 mm, and it may be up to more than 1.0 mm.

In accordance with another feature of the invention, there
25 are provided spacer ridges formed on a circumference of the backwall, the spacer ridges being in contact with the inner

wall surface of the tubular body and defining the spacing distance.

With the above and other objects in view there is also

5 provided, in accordance with the invention, a combination caulking gun and cartridge. The cartridge has a substantially tubular body, a forward dispensing nozzle at a forward end of the tubular body, a backwall movably disposed within the tubular body, the tubular body defining a chamber
10 therein between the forward end and the backwall. The caulking gun thereby comprises a body forming a trough for receiving the cartridge, and a piston movable parallel to the trough for pushing the backwall forward within the tubular body and causing a reduction of volume within the chamber in
15 the cartridge. The tubular body has a wall with an inner wall surface defining an inner diameter of the tubular body, and the backwall having a diameter less than the inner diameter of the tubular body and defining a substantially contact-free spacing distance between the inner wall surface
20 and the backwall.

In accordance with a further feature of the invention, there are provided means operatively associated with the tubular body of the cartridge for preventing a radial expansion of
25 the tubular body while the piston forces the backwall forward. These prevention means may be in the form of a

rigid tubular sleeve tightly fit on the tubular body, for instance by slipping the cartridge into the sleeve.

In accordance with again another feature of the invention,
5 the tubular sleeve is formed of a hard material selected from the group consisting of PVC, fiber-reinforced plastic, and metal.

In accordance with again a further feature of the invention,
10 the prevention means is a clamp device disposed at the trough of the caulking gun for selectively squeezing the tubular body of the cartridge.

In accordance with a concomitant feature of the invention,
15 the caulking gun has a trigger handle pushing the piston forward for dispensing caulking composition, and the clamp device is connected to the trigger handle of the caulking gun such that the tubular body is squeezed simultaneously with the piston forcing the backwall forward.

20 Other features which are considered as characteristic for the invention are set forth in the appended claims.

Although the invention is illustrated and described herein as
25 embodied in a caulking gun and cartridge with afterflow prevention, it is nevertheless not intended to be limited to

the details shown, since various modifications and structural changes may be made therein without departing from the spirit of the invention and within the scope and range of equivalents of the claims.

5

The construction of the invention, however, together with additional objects and advantages thereof will be best understood from the following description of the specific embodiment when read in connection with the accompanying drawings.

10

Brief Description of the Drawings:

Fig. 1 is a perspective view of a prior art caulking gun;

15

Fig. 2 is a longitudinal section of a prior art caulking cartridge;

Fig. 3 is a similar section of a caulking cartridge according to a first embodiment of the invention;

20

Fig. 4 is rear elevational view of a backwall of a caulking cartridge of a second embodiment;

Fig. 5 is a section thereof taken along the line V-V in Fig.

25

4;

Fig. 6 is a front elevational view of a piston corresponding to the embodiment of Figs. 4 and 5;

Fig. 7 is a longitudinal section of a rigid sleeve according to a third embodiment of the invention;

Fig. 8 is a diagrammatic front view section of a trough of a caulking gun; and

Fig. 9 is a side elevational view of a caulking gun with a squeeze mechanism.

Description of the Preferred Embodiments:

Referring now to the figures of the drawing in detail and first, particularly, to Fig. 1 thereof, there is seen a conventional caulking gun. A forward body 1 is formed with a trough 2, which receives a caulking cartridge. A piston stem 3 pushes a plunger head 4 forward towards a forward end wall 5 of the trough 2. A locking dog 6 prevents the stem 3 from moving backwards, and a spring 7 biases the dog 6 into the locking position. The stem 3 is released and allowed to move backwardly by swinging the dog 6 forward into a substantially vertical release position.

With reference to Fig. 2, a typical prior art caulking tube has a tubular body 8. Usually, the body is formed as a cylindrical tube 8, which is formed of paper laminate,

fibrous plastics, rolled metal sheets, or the like. The cylindrical tube 8 is relatively soft and, in response to increased pressure in the interior chamber thereof, it expands radially. A nozzle tip 9 is formed on a forward closure wall 10. The tube 8 is air-tightly closed in the rear with a backplate 11. An outer cylindrical flange 12 of the backplate 11 has an outer radius which corresponds to an inner radius of the tube 8. The flange 12 forms a sliding seal between the inner wall surface of the tube 8 and the backwall 11. A reinforcing ring 14 with a cylindrical seal flange 15 is clamped at the rear edge of the tube 8. In storage, the backwall 11 is disposed directly adjacent the ring 14, such that the flange 12 is clamped under the seal flange 15. Only after the forward wall 10 is punctured and the nozzle tip 9 is cut to form a dispenser opening is the backwall 11 pushed forward for dispensing caulking composition 13.

As the backwall 11 is pushed forward and the flange 12 slides as along the inner wall surface of the tube 8, the caulking composition 13 is forced from the dispensing tip because of the increased pressure inside the tube chamber. Besides pushing composition 13 out of the dispensing tip, the increased pressure also causes the tube body to expand radially. In fact, it can be shown that the radial pressure on the cylindrical tube wall is exactly twice the axially

acting pressure towards the dispensing opening. This radial "breathing" of the tube 8 causes afterflow when the piston 4 is no longer actuated and the tube 8 resiliently relaxes its increased diameter towards the relaxed position.

5

Referring now to Fig. 3, which illustrates a first embodiment of the invention, an outer diameter OD of the cylindrical flange 12 is smaller than an inner diameter ID of the tube 8 by a spacing ΔD . The spacing ΔD is chosen in dependence on the caulking composition 13, i.e. on the viscosity and its reaction rate with air. In other words, the higher the viscosity of the composition, the greater the spacing ΔD . Further, the more inert the composition is relative to the atmosphere, the greater the spacing ΔD . In general, tubes for typical silicones, glycerol esters, resin and rosin acids, and the like may be provided with a spacing of $\Delta D = 1$ mm.

Tubes for compositions with lower viscosity may be provided with $\Delta D \leq 0.2$ mm. Proper spacings may be chosen by those of skill in the art.

The flange 12 and the inner wall surface of the tube 8 form a contact-less seal by virtue of a small amount of caulking composition which is allowed to seep therebetween. Due to

the fact that the dispensing opening is substantially larger in area than the area defined (approximately) by the spacing ΔD times the circumference, only a negligible amount of caulking composition is allowed to escape through that route.

5 As soon as the pressure on the piston is relaxed and the piston is moved back, the backwall 11 follows suit as the tube wall attains its relaxed position. As the caulking composition within the spacing between the flange 12 and the tube is still fresh (its viscosity is at its minimum), the
10 backwall 11 slides easily. Shortly after the backwall has reached its relaxed position (i.e. the tube body is relaxed), the remaining caulking composition which is exposed to air is allowed to harden, and thus form a proper seal. The remaining composition within the cartridge chamber is sealed
15 against the atmosphere.

After manufacture, i.e. during shelf storage before initial use, the backwall 11 is sealed similarly to conventional prior art systems.

20

The caulking tube system with a spacing $\Delta D > 0.0$ mm may at first appear illogical because the compositions contained in such tubes cure upon contact with the air and any such opening rather goes against common sense. However, the
25 inventor has been able to ascertain that, after actuation, a

sealing ring of dried composition forms between the flange 12 and the inner wall surface of the tube 8. As the piston 4 pushes the backwall 11 forward during the next dispensing operation, that temporary seal is broken and the slide seal
5 between the flange 12 and the inner wall surface of the tube 8 is effected by soft composition. When the pressure on the piston 4 by the piston stem 3 is relaxed immediately after dispensing, the contracting tube 8 is able to push the backwall 11 back, instead of causing undesirable afterflow.

10 With reference to Fig. 4, a second embodiment, which may be combined with the first embodiment, is defined with an active pull-back feature. The flange 12 is provided with two mutually opposite latches 16. As the piston 4 is pushed into the opening defined by the flange 12, it engages behind the
15 latches 16. When the backwall 11 is thus engaged, it is possible to actively retract the backwall 11 by pulling back on the stem 3. In a preferred embodiment (Fig. 6), the piston plunger 4 may be provided with cutouts 17, which allow selective engagement of the piston 4 with the latches 16.

20 Referring again to Fig. 4, the spacing between the inner tube wall surface and the flange 12 may be defined by ridges 19 integrally formed on the circumference on the backwall 11, i.e. on the flange 12.

In a third embodiment, the radial expansion of the tube 8 is prevented altogether in that a non-elastic sleeve 18 is slipped over the tube 8. The sleeve 18 may be formed of hard PVC, fiber reinforced plastic, metal, or similar material.

5 The inner diameter of the sleeve 18 is chosen such that it corresponds with the outer diameter of the tube 8.

Furthermore, the sleeve 18 is made as thin as possible, so that it still fits into the trough 2 of the caulking gun.

10 With reference to Fig. 8, the rigid sleeve may be replaced with a top lid 20 which is articulated at an edge of the trough 1 of the caulking gun body. As the lid 20 is closed and latched into a latch hook 21, a rigid sleeve is formed for the caulking tube.

15

Finally, in a fourth embodiment, the tube 8 is squeezed in addition to dispensing by forwarding the backwall 11. When dispensing is no longer desired, the squeeze on the tube 8 is relaxed. Accordingly, in a preferred structural embodiment

20 of the invention, the caulking gun is provided with a clamp device which squeezes the tube simultaneously to forwarding the backwall 11. As illustrated in Figs. 8 and 9, the lid 20 is braced with two strips 22 connected between the latch 21 and, with the opposite ends thereof, the trough body 1. As
25 the trigger handle 23 is pulled for advancing the piston 4, wedges 24 are pulled below the strips 22. This causes the

strips 22 to clamp down the lid 20 and thus to actively compress the caulking tube 8. The lid 20 is preferably formed with a slightly larger diameter than the trough. This leads to a slightly elliptical cross section of the space
5 which is occupied by the caulking cartridge.

While we have herein referred to "caulking guns" and "caulking compositions", it should be understood that the terms are to be understood as commonly used in the art,
10 namely any such dispenser with piston actuated volume reduction in tubular containers and with compositions of any type which are subject to the afore-mentioned afterflow problem.

I claim:

1. An improved caulking cartridge, of the type having a substantially tubular body, a forward dispensing opening at a forward end of the tubular body, a backwall movably disposed within the tubular body, the tubular body having a wall with an inner wall surface defining an inner diameter of the tubular body, and the tubular body defining a chamber therein bounded by the inner wall surface, the forward end and the backwall, for storing therein a fluid composition to be dispensed through the forward dispensing opening, the improvement which comprises:

the backwall having a diameter adapted to the inner diameter of the tubular body such that the fluid composition is allowed to flow into an annular space formed between the inner wall surface and a periphery of the backwall, whereby the backwall moves backwardly away from the forward end of the tubular body when a pressure inside the chamber is greater than a pressure outside the chamber.

2. The cartridge according to claim 1, which further comprises spacer ridges formed on a circumference of said backwall, said spacer ridges being in contact with said inner wall surface of said tubular body and defining a spacing distance of said spacing.

3. In combination, a caulking gun and a cartridge, said cartridge having a substantially tubular body, a forward dispensing nozzle at a forward end of said tubular body, a backwall movably disposed within said tubular body, said tubular body defining a chamber therein between said forward end and said backwall, and a fluid composition stored in the

chamber to be dispensed through the forward dispensing nozzle;

said caulking gun comprising a body forming a trough for receiving said cartridge, and a piston movable parallel to said trough for pushing said backwall forward within said tubular body and causing a reduction of volume within said chamber in said cartridge;

said tubular body having a wall with an inner wall surface defining an inner diameter of said tubular body, and said backwall having a diameter adapted to the inner diameter of the tubular body such that the fluid composition is allowed to flow into an annular space formed between the inner wall surface and a periphery of the backwall, whereby the backwall moves backwardly away from the forward end of the tubular body when a pressure inside the chamber is greater than a pressure outside the chamber.

Abstract of the Disclosure:

A caulking gun and cartridge combination is provided with afterflow prevention. The cartridge has a tubular body, a forward dispensing opening at a forward end of the tubular body, and a backwall movably disposed within the tubular body. The caulking gun has a trough for receiving the cartridge, and a piston movable parallel to the trough. A trigger handle is used for pushing the backwall forward within the tubular body and causing a reduction of volume within the chamber in the cartridge. The backwall slides substantially in a contactless manner within the tubular body, preferably by way of a reduced diameter of the backwall relative the inner diameter of the tubular body, so that it is pushed backwardly when the body retracts radially after actuation. Alternatively, the cartridge body may be prevented from expanding or may even be actively squeezed so that afterflow caused by the volume reduction of the relaxing tube body is safely prevented.

WHS/bb

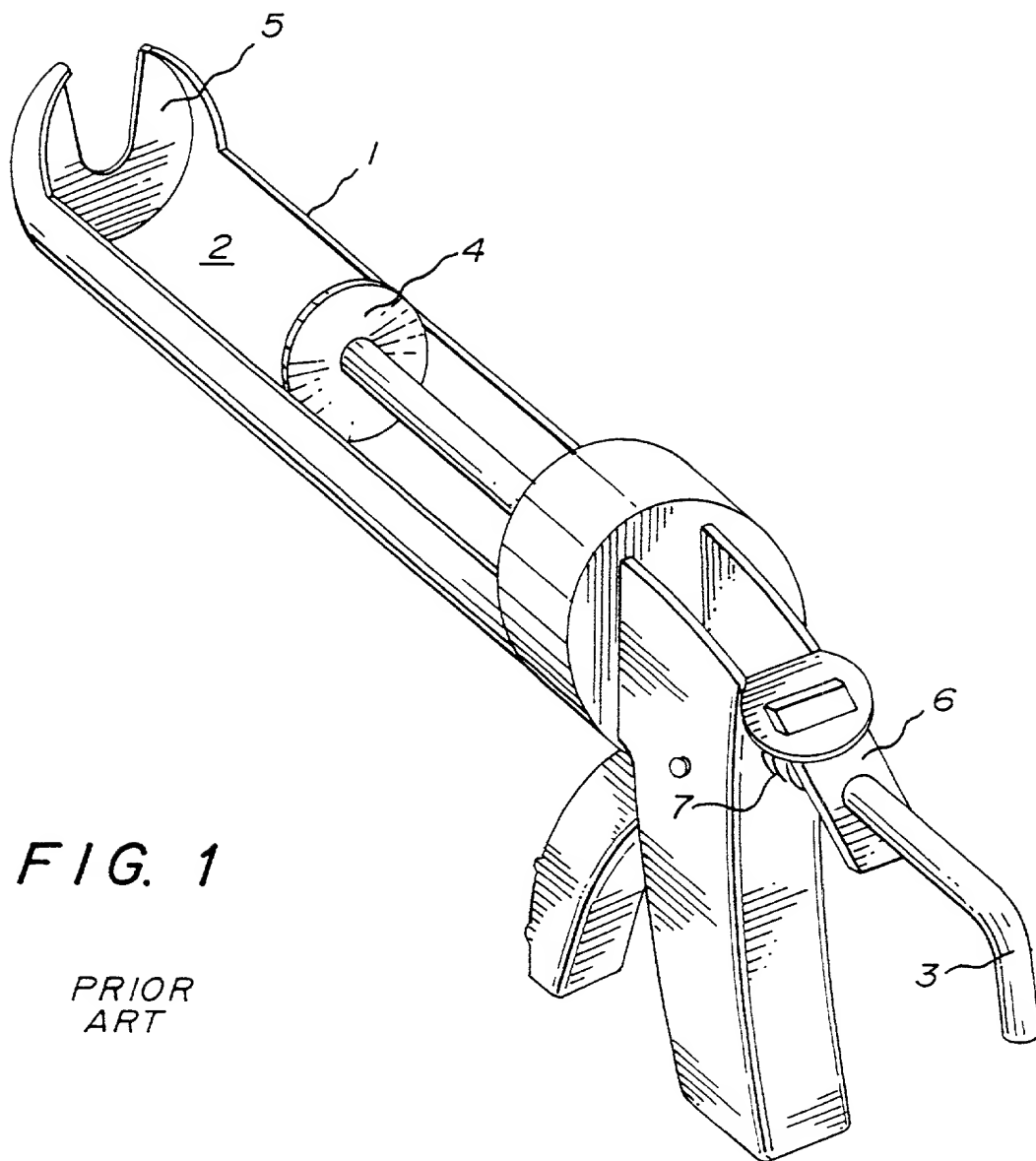


FIG. 1

PRIOR
ART

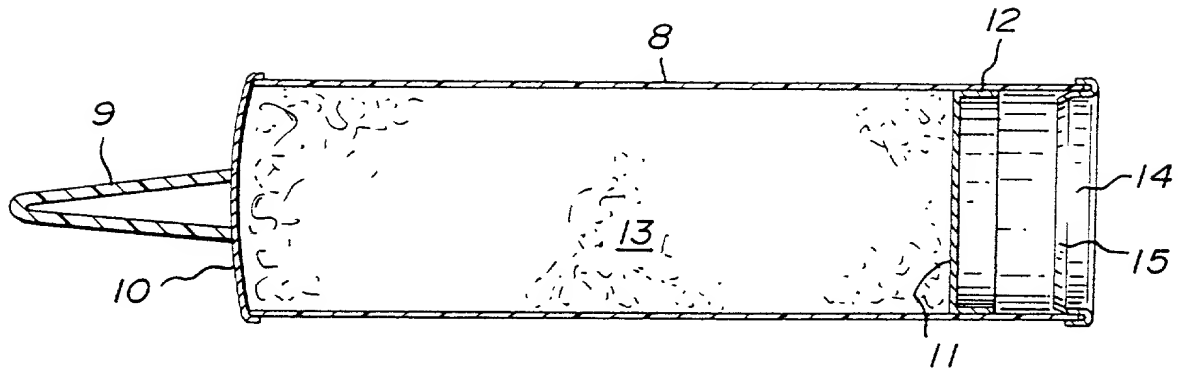


FIG. 2

PRIOR
ART

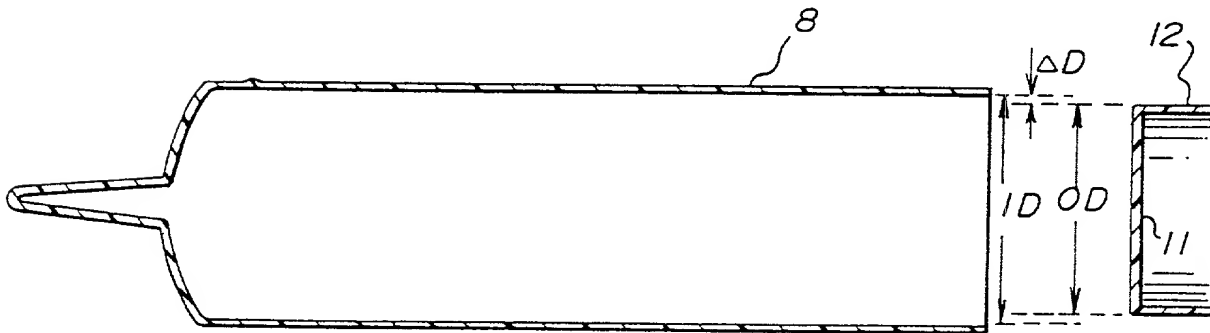


FIG. 3

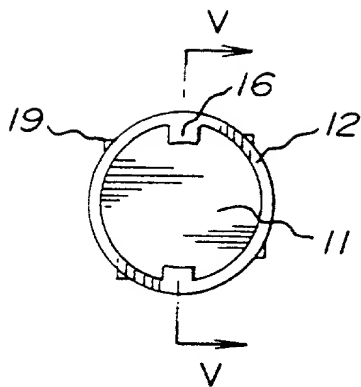


FIG. 4

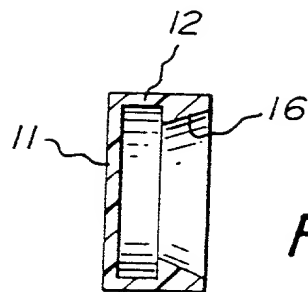


FIG. 5

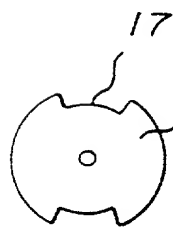


FIG. 6

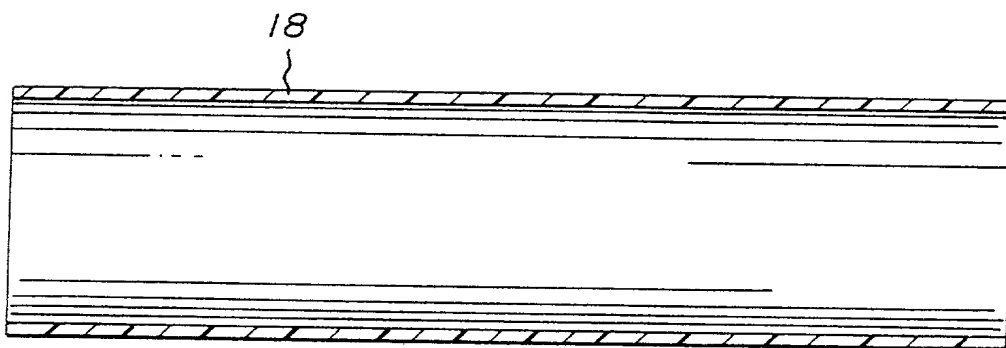


FIG. 7

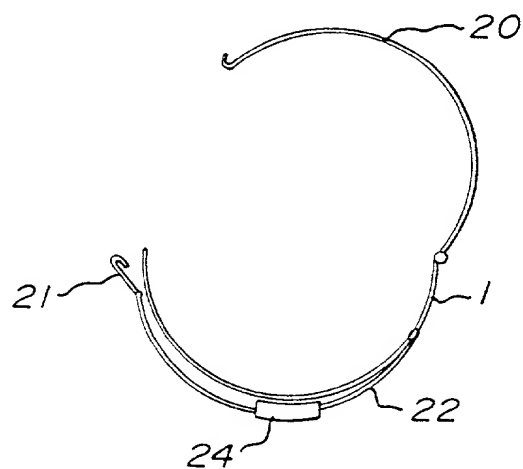


FIG. 8

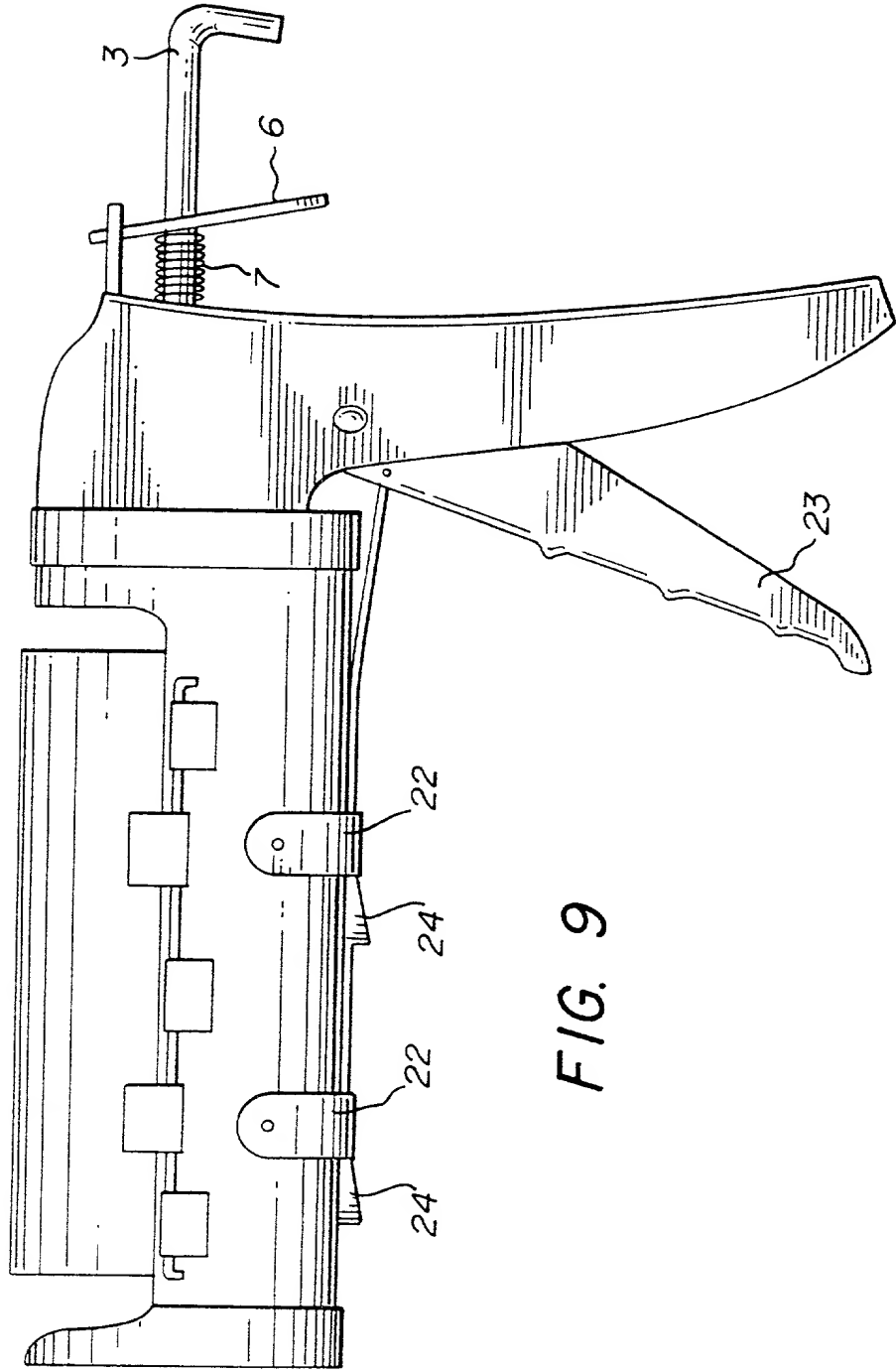


FIG. 9

COMBINED DECLARATION AND POWER OF ATTORNEY
IN ORIGINAL APPLICATION

As a below named inventor, I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that I verily believe that I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

CAULKING GUN AND CARTRIDGE WITH AFTERFLOW PREVENTION

described and claimed in the attached specification, that I understand the content of the attached specification, that I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve month prior to this application, that I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application under 37 C.F.R. 1.56a, and that no application for patent or inventor's certificate of this invention has been filed earlier than the following in any country foreign to the United States prior to this application by me or my legal representatives or assigns:

Dutch Application Serial No. 9401492, filed September 13, 1994, the International Priority of which is claimed under 35 U.S.C. §119.

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

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I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

Case	Age	Sex	Duration	Site	Histology	Immunohistochemistry	Molecular biology	Genetics	Prognosis	Treatment	Outcome	Comments	References	
													1	2
1	45	M	10 years	Rectum	Adenocarcinoma	+	+	+	Good	Chemotherapy	Alive	10 years follow-up	[1, 2]	
2	55	F	5 years	Colon	Adenocarcinoma	+	+	+	Good	Chemotherapy	Alive	5 years follow-up	[3, 4]	
3	65	M	15 years	Rectum	Adenocarcinoma	+	+	+	Good	Chemotherapy	Alive	15 years follow-up	[5, 6]	
4	75	F	20 years	Colon	Adenocarcinoma	+	+	+	Good	Chemotherapy	Alive	20 years follow-up	[7, 8]	
5	85	M	25 years	Rectum	Adenocarcinoma	+	+	+	Good	Chemotherapy	Alive	25 years follow-up	[9, 10]	

INVENTOR'S SIGNATURE:

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